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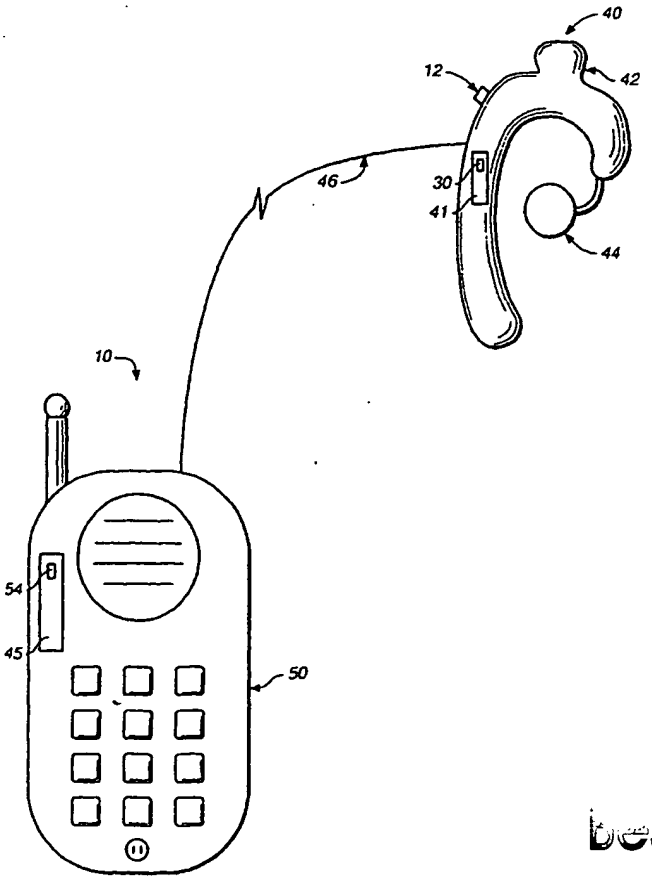
(54) Title: APPARATUS AND METHOD FOR CELLULAR TELEPHONE FLASH/HOOK SWITCH IN WIRELESS HEADSET



(57) Abstract: The present invention relates to a new and improved apparatus for a cellular telephone flash/hook switch in a wireless headset. It provides the functionality of the push-button switch included with wired headsets/earpieces and the ability to enable telecommunications remotely without unnecessary power drain. The present invention includes a wireless headset unit and a telephone module. The wireless headset includes a headset switch having an activation state and a headset circuit. The headset circuit transmits a wireless signal upon detection of the activation state of the headset switch. The telephone module includes a telephone module circuit which provides telecommunication between the wireless headset and the telephone device upon receiving the wireless signal.

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APPARATUS AND METHOD FOR CELLULAR TELEPHONE FLASH/HOOK SWITCH IN WIRELESS HEADSET

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention generally relates to a wireless communication system, and more particularly to an apparatus and method for a cellular telephone flash/hook switch in a wireless headset.

Discussion of the Prior Art

Currently, cellular phones are commercially available with special features that support substantially hands-free operation of the phone through the use of wired headsets. Such hands-free functionality is implemented by a control switch located on a wire connecting the cellular phone and the wired headset. Once the control switch is activated, a momentary short is generated across the microphone circuitry within the cell phone. The phone senses and uses that microphone shorting to control certain telecommunication functions, such as off-hook to receive an incoming call, on-hook to end a current call, and enable voice dialing to initiate a call.

The hands-free communication earpiece unit is worn on either ear and includes a high-fidelity speaker, a noise reducing microphone and an earpiece. A wire is attached to the earpiece and to the cellular phone in close proximity to the user, with the momentary push-button attached in between the earpiece and cell phone.

A disadvantage of the aforementioned communication system is that the wire connecting the headset to the cellular phone is cumbersome and limits hands-free movement. The wire itself may also disadvantageously get in the way of body

movements by getting caught on peripheral objects thereby limiting the range of motion of the user.

One prior art solution to the aforesaid disadvantage and limitation is to provide a wireless RF connection between the headset and the cellular telephone. For example, as disclosed by Kim, et al. in U.S. Patent No. 5,943,627, a cellular phone is modified with a radio handset which establishes a communication link between the handset and the telephone.

The '627 patent enables telecommunication by detaching the radio handset from the body which serves to relay a sound and signal information in between the radio handset and the base station. The physical removal of the handset from the body initiates the normal methods of radio communication, i.e. modulation of an information signal onto a carrier signal using either amplitude modulation or frequency modulation.

A disadvantage and limitation of the device as disclosed in the '627 patent is that telecommunication can not be initiated remotely but rather must occur only at the time the handset is physically removed from the cell phone body. Removal of the handset fully activates the unit which initiates battery drain. Furthermore, having to remove the handset in order to initiate telecommunication is inconvenient. In portable radio devices, minimization of battery power usage is critical. Once the handset is removed, both the transceiver located in the handset and the transceiver located in the cell phone body must be fully activated. An always activated portable device would cause an unnecessary drainage of power from the respective batteries.

To overcome the disadvantage and limitation of the always on device, one known prior art solution is to operate a portable radio device with a normally quiescent mode, and periodically activating the device to determine if a manually controlled transceiver is transmitting. The device then either stays awake or goes back to sleep, depending on whether it is receiving a signal or not. A limitation

of the aforementioned prior art is that the timer cycle provides solely a transmission detection function through the normal methods of radio communication. The transmission detection function does not provide a shorting contact which would enable the cellular phone to initiate an operation.

The present invention overcomes said disadvantage and limitation by using the radio link to initiate the shorting contact across the cellular microphone to provide for telecommunication as well as transmission detection. The unit is normally hands-free without always being in an activation state.

SUMMARY OF THE INVENTION

Therefore it is one objective of the present invention to provide a new and improved apparatus for a cellular telephone flash/hook switch in a wireless headset.

Accordingly, the present invention overcomes the disadvantages and limitations of the prior art by providing a push-button switch on a wireless headset to remotely actuate telecommunication between the wireless headset and the wireless cellular phone.

The present invention provides a new and improved wireless communication system including a wireless headset unit and a telephone module. The wireless headset unit includes a headset switch having a selectable activation state and a headset circuit. The headset circuit transmits a wireless signal upon detection of the activation state of the headset switch. The telephone module includes a telephone module circuit which provides telecommunication between the wireless headset and the telephone module upon receiving the wireless signal.

Another embodiment of the present invention provides a wireless communication system including a wireless headset unit and a telephone module. The wireless headset unit includes a first headset switch to actuate the wireless

headset unit, a second headset switch having a selectable activation state to provide a shorting signal, and a headset circuit. Upon detection of the actuation of the wireless headset unit, the headset circuit transmits a wireless signal. The telephone module includes a telephone module circuit having a microphone circuit, wherein a shorting across the microphone circuit occurs upon detection of the shorting signal provided by the activation state of the second headset switch. Upon receiving the wireless signal, the telephone module circuit provides telecommunication between the wireless headset and the telephone module.

Another aspect of the present invention provides a wireless communication system including a wireless headset and a telephone module. The wireless headset unit includes a headset switch, a headset processing device and a headset transceiver. The headset processing device, in response to detecting an activation of the headset switch, activates the headset transceiver to provide for transmission of a wireless signal. The telephone module includes a telephone module transceiver, a telephone module processing device, and a telephone module switch. The telephone module processing device activates the telephone module switch in response to the telephone module transceiver detecting the wireless signal such that wireless telecommunication between the wireless headset and the telephone module is established.

Yet another aspect of the present invention provides a new and improved method for using a wireless communication system in which a telephone module is used in conjunction with a wireless headset. The method includes activating a headset switch to provide a wireless signal transmission generated from the wireless headset and detecting, by the telephone module, the wireless signal transmission to provide for telecommunication between the wireless headset and the cellular telephone module.

Alternatively a method for using a wireless communication system in which a cellular phone is used in conjunction with a remote wireless headset is provided.

The cellular phone has an on-call state, an off-call state and a ringing state, and the remote wireless headset has a switch. The method includes pressing a switch on a remote wireless headset to initiate a call being generated from a cellular phone when the cellular phone is in the off-call state, pressing a switch on a remote wireless headset to answer a call being placed to a cellular phone when the cellular phone is in the ringing state, and pressing a switch on a remote wireless headset to hang-up a call currently in telecommunication with a cellular phone when the cellular phone is in the on-call state.

For a better understanding of the present invention, together with other and further objects thereof, reference is made to the following description, taken in conjunction with the accompanying drawings, and its scope will be defined in the appending claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a wireless communication system;

Fig. 2 is a schematic block diagram of a wireless headset unit;

Fig. 3 is a schematic block diagram of a telephone module;

Fig. 4 illustrates a flow chart useful in describing a method for using a wireless communication system;

Fig. 5 illustrates a flow chart useful in describing a method for detecting, through a test state, the wireless signal;

Fig. 6 illustrates a flow chart useful in describing a method for using a wireless communication system in which a telephone module is used in conjunction with a wireless headset, wherein the telephone module has an on-call state, an off-call state and a ringing state, and the wireless headset has a switch; and

Fig. 7 illustrates a flow chart useful in describing a method for using a wireless communication system in which a telephone module is used in conjunction

with a wireless headset, wherein the telephone module has an on-call state, an off-call state, a ringing state, a call-waiting state and a conference call state, and the wireless headset has a switch.

DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 is a perspective view of a wireless communication system 10. Accordingly, the system 10 includes a wireless headset 40 and a telephone module 50. The wireless headset 40 includes a headset switch 12 having a selectable activation state and a headset circuit 41 having a headset transceiver 30. Optionally, the headset 40 may be configured as a single earpiece. The headset 40 further includes a speaker 44 and a microphone 42 to enable the user to listen and speak once telecommunication has begun.

The telephone module 50 includes a telephone module circuit 45 having a telephone module transceiver 54 which provides for telecommunication between the wireless headset 40 and the telephone module 50. For example, the headset switch 12 will toggle the headset transceiver 30 between an inactive state and an active state. When the headset transceiver 30 is in the active state, it transmits an RF carrier signal 46 that is detected by the telephone module transceiver 54 in the telephone module 50. When the telephone module transceiver 54 detects a change from not receiving an RF carrier signal 46 from the headset transceiver 30 to receiving an RF carrier signal 46 from the headset transceiver 30, the telephone module transceiver 54 initiates a short duration contact between a pair of contacts configured for connection to a microphone circuit in the telephone module 50. This shorting may initiate telecommunication between the headset 40 and the telephone module 50. The shorting may also be used to effect mode changes within the wireless communication system 10. Optionally, the telephone module

50 may be a cellular phone. In another embodiment, the telephone module 50 may be a belt-mount unit having a cellular telephone interface. Alternatively, the telephone module 50 may be an adapter style module configured for attachement to a cellular phone.

In accordance with an aspect of the presently claimed invention, Fig. 2 is a schematic block diagram of a wireless headset unit 40. The headset 40 may be configured as an earpiece. Headset 40 includes a switch 12, a resistor 16, a microprocessor 20, a transceiver 30, an antenna 34, a speaker 44 and a microphone 42. For example, the switch 12 may be a momentary contact switch. Optionally, the transceiver 30 may include a NUMA chip (NT2903) which is a commercially available chip used in a transceiver circuit.

In the example of Fig. 2, the switch 12 includes an output 14 connected in common to each of the resistor 16 and a microprocessor input 18. When the switch 12 is activated, the microprocessor 20 toggles between a sleep state and an active state. When the microprocessor 20 is in the active state, it activates the transceiver 30 via the microprocessor control signal 22. Once activated, the transceiver 30 transmits a transmission via the antenna 34. By way of example, the transmission may be an RF signal. In another example, the transmission may be a generated tone modulated with an RF signal. Optionally, the transmission may be selectively a digital signal, an infrared signal, and any other communication signal.

Fig. 3 is a schematic block diagram of a telephone module 50. The telephone module 50 includes a transceiver 54, a microprocessor 72, an antenna 66, a switch 82 and a cell phone interface 90 having a speaker connection terminal 84, a microphone connection terminal 86 and a ground connection terminal 88. The switch 82, for example, may be an FET switch.

The microprocessor 72 is programmed to operate in a sleep state, with a periodic test state, unless the transceiver 54 is receiving a transmission from the

associated wireless headset unit 40, as illustrated in Fig. 1. The transceiver 54 operates in sleep mode unless the microprocessor 72 is in active mode, in which case the microprocessor 72 activates the transceiver 54 via the control signal 60. In the periodic test state, the microprocessor 72 activates the transceiver 54 and tests, via the RSSI signal 70, to determine if the transceiver 54 is receiving a signal from the associated wireless headset unit 40, as illustrated in Fig. 1. As long as a receive signal is being received, the microprocessor 72 and the transceiver 54 remain in active state. When the receive signal is no longer present, the microprocessor 72 and the transceiver 54 return to the sleep state with periodic test states, thus power consumption is minimized.

The microprocessor 72 is programmed such that if it enters a test state and determines that a transmission is being received from the associated wireless headset unit 40, the microprocessor 72 causes the switch 82 to be closed for a predetermined period of time. By way of example, the predetermined period of time may be between 100mS and 500 mS.

When the radio link is not in use, both the microprocessor 20 and the transceiver 30 in the wireless headset unit 40 of Fig.1 are in sleep mode. Additionally, the microprocessor 72 and the transceiver 54 in the telephone module 50 of Fig. 2 are also in sleep mode when the radio link is unused, except during the periodic test state, thereby reducing power consumption.

When the switch 12 is activated on the wireless headset unit 40, the headset unit 40 changes to the active state and transmits. When the telephone module 50 senses the transmission from the headset 40, the telephone module 50 activates the switch 82 which shorts the microphone connection terminal 86 for the predetermined time period, and the telephone module 50 remains in active state, linked with the headset 40.

An embodiment of the present invention provides a wireless headset 40 having a first headset switch and a second headset switch 12. The first headset switch actuates the wireless headset 40, which may result in the activation of the telephone module 50. The second headset switch 12 provides for a shorting signal which may control the shorting state of the microphone connection terminal 86. In this embodiment, the shorting operation is independent of the activation of the wireless headset unit and therefore provides the user control over the duration and number of shorting occurrences.

According to another embodiment, the switch 12 causes a tone to be generated during the period of time that the switch 12 is actuated. The wireless signal is then modulated with tone and transmitted by the transceiver 30. Upon detecting the tone, the transceiver 54 then effects a microphone shorting connection for a period of time substantially concurrent with the period of time that the tone is being detected on the modulated carrier signal.

In another embodiment, the switch 12 causes a digital code, or digital signal, to be generated and transmitted by the transceiver 30. Upon detecting the digital signal, the transceiver 54 then effects a microphone shorting connection for a period of time specified by the digital signal that is being detected. Optionally, the signal may be a communication signal, for example an infrared signal.

Alternatively, the switch 12 is independent of, and has no effect upon the state of the transceiver 30, wherein multiple operations of the switch 12 result in transmission of multiple sequences of the tone. The multiple transmissions then initiate multiple corresponding periods of a microphone shorting connection which provide for certain operations to be performed, including, for example, switching call waiting and bridging conference calls.

In the examples of Fig. 2 and Fig. 3, once the switch 12 is activated again, the microprocessor 20 and transceiver 30 go into sleep state. Upon no longer detecting the wireless signal transmission, the microprocessor 72 and the

transceiver 54 on the telephone module 50 go into sleep state. The shorting to ground of the microphone connection terminal 86 can be used by the cell phone as a message to initiate an operation. By way of example, the operation may include an off-hook (answer call), on-hook (hang-up), initiate-a-call (voice recognition). Optionally, multiple activations of switch 12 cause a call switch operation when there is a call waiting and a bridge call when there is a conference call.

One embodiment of the present invention includes a pair of radio transceivers, transceiver 30 and transceiver 54, with transceiver 54 configured for attachment to a cellular telephone and transceiver 30 included within a headset 40 wherein the headset 40 may be configured as a single earpiece. The headset 40 is provided a momentary contact push-button 12 that will toggle the transceiver 30 between an inactive, or "sleep" state, and an active, or "in-use" state. When the transceiver 30 is in active state, it transmits an RF carrier signal to be detected by the transceiver 54. When the transceiver 54 detects a change from not receiving an RF carrier signal from the transceiver 30 to receiving an RF carrier signal from transceiver 30, transceiver 54 initiates a short duration (momentary) contact between a pair of contacts configured for connection to a microphone circuit in a cellular telephone.

In a yet another embodiment, the effect of the state transitions is that when the radio link is not in use, the microprocessors 20 and 72 in both the earpiece 40 and in the associated telephone module 50, as well as their respective transceiver circuits 30 and 54, are in sleep mode except during the periodic test state of the telephone module 50, thus reducing power consumption. When the momentary switch 12 is actuated on the earpiece 40, the earpiece 40 changes to active state and transmits. When the telephone module 50 senses the RF signal from the earpiece 40 (during a test state) the telephone module 50 activates an FET switch 82 which shorts the microphone connection terminal 86 for a predetermined duration. The telephone module 50 remains in active state, thus still linked to the

earpiece 40. When the momentary button 12 on the earpiece 40 is pushed again, the earpiece microprocessor 20 and transceiver circuit 30 go into sleep state which results in the telephone module 50 ceasing to receive RF signal from the earpiece 40. With no signal from the earpiece 40, the microprocessor 72 and the transceiver 54 on the telephone module 50 go into sleep state. The shorting to ground of the microphone contact terminal 86 can be used by a cellular phone as a message to initiate certain functions such as "answer call" or "initiate voice recognition function".

Fig. 4 illustrates a flow chart useful in describing a method for using a wireless communication system and generally designated by the numeral 100. Referring to figures 2 through 4, a switch 12 is activated, as indicated at 102, which is then sensed by a control circuit 20, as indicated at 104. The control circuit 20 sends a control signal to a transceiver 30 initiating the transceiver 30 to enter into an active state, as indicated at 106. Then at 108, the transceiver 30 transmits a wireless signal to be detected by the associated telephone module 50, as indicated at 110. Once the telephone module 50 has detected the wireless signal, it initiates an operation, as indicated at 112, which provides for telecommunication between the wireless headset 40 and the telephone module 50. Optionally, the operation may be initiate-a-call, off-hook, on-hook, switch calls, bridge calls, determining on-call, determining ringing, determining multiple switch activation, determining call-waiting and determining conference call.

Fig. 5 illustrates a flow chart useful in describing a method for detecting, through a test state, the wireless signal and generally designated by the numeral 120. Now referring to figures 2,3 and 5, a time constant is initialized with a start time, as indicated at 122. The time constant is then incremented, as indicated at 124. Then at 126, it is determined if the time constant has reached the end time. If the time constant has not yet reached the end time, the method loops back to 124 to increment the time constant again. If the time constant has reached the end

time, a telephone module control circuit 72 is activated, as indicated at 128. The telephone module control circuit 72 then activates a telephone module transceiver 54, as indicated at 130. A telephone module 50 then determines if a headset transceiver 30 is transmitting a wireless signal, as indicated at 132. If the headset transceiver 30 is not transmitting the wireless signal, then the telephone module transceiver 54 is deactivated, as indicated at 138. Then at 140, the telephone module control circuit 72 enters into a sleep mode. At that point, the method loops back to 122 to initialize the time constant again and begin the timer cycle. If the headset transceiver 30 is transmitting the wireless signal, then a shorting connection is provided across a microphone circuit, as indicated at 134. Then at 136, an operation is initiated. After the operation has taken place, the method loops back to 132 to determine if the headset transceiver 30 is still sending the wireless signal.

Fig. 6 illustrates a flow chart useful in describing an embodiment of a method for using a wireless communication system in which a telephone module is used in conjunction with a wireless headset, wherein the telephone module has an on-call state, an off-call state and a ringing state, and the wireless headset has a switch. The method is generally designated by the numeral 150. Now referring to figures 2, 3 and 6, it is first determined if the telephone module 50 is in the on-call state, as indicated at 152.

If the telephone module 50 is in the on-call state, it is then determined whether a switch 12 has been activated, as indicated at 164. If the switch 12 has been activated, the hang-up operation is initiated, as indicated at 166. If the switch has not been activated, the method loops back to 152 to again monitor the on-call state.

If the telephone module 50 is not in the on-call state, it is then determined at 154 whether a switch 12 has been activated. If the switch 12 has been activated, the "voice recognition" (initiate-a-call) operation is activated, as indicated at 156.

Then the method loops back to 152 to again monitor the on-call state. If the switch 12 has not been activated, then it is determined if the telephone is in the ringing state, as indicated at 158.

If the telephone module 50 is not in the ringing state, then a test state is entered to determine if a wireless signal is being transmitted, as indicated at 168. Once the wireless signal has been detected, link-mode is established and the method loops back to 152 to again monitor the on-call state.

If the telephone module 50 is in the ringing state, then it is determined if the switch 12 has been activated, as indicated at 160. If the switch 12 has been activated, then the call is answered, as indicated at 162. If the switch 12 has not been activated then the method loops back to 158 to determine if the telephone module 50 is still in the ringing state.

Once the call has been answered, as indicated at 162, the telephone module 50 is in the on-call state and it is then determined whether a switch 12 has been activated, as indicated at 164. If the switch 12 has been activated, the hang-up operation is initiated and the call is terminated, as indicated at 166. Once the call is terminated, a test state is entered to determine if a wireless signal is being transmitted, as indicated at 169. Once the wireless signal has been detected, link-mode is established and the method loops back to 152 to again monitor the on-call state. If the switch has not been activated, the method loops back to 152 to again monitor the on-call state.

Fig. 7 illustrates a flow chart useful in describing yet another embodiment of a method for using a wireless communication system in which a telephone module is used in conjunction with a wireless headset, wherein the telephone module has an on-call state, an off-call state, a ringing state, a call-waiting state and a conference call state, and the wireless headset has a switch. The method is generally designated by the numeral 170. Now referring to figures 2, 3 and 7, it

is first determined if the telephone module 50 is in the on-call state, as indicated at 152.

If the telephone module 50 is in the on-call state, it is then determined whether a switch 12 has been activated, as indicated at 164. If the switch has not been activated, the method loops back to 152 to again monitor the on-call state. If the switch 12 has been activated, it is then determined if the switch 12 has been activated multiple times, as indicated at 172. If the switch 12 has not been activated multiple times then the hang-up operation is initiated and the call is terminated, as indicated at 166. Once the call is terminated, a test state is entered to determine if a wireless signal is being transmitted, as indicated at 169, as indicated at 169. Once the wireless signal has been detected, link-mode is established and the method loops back to 152 to again monitor the on-call state. If the switch 12 has been activated multiple times, then it is determined if the telephone module 50 is in the call waiting state, as indicated at 174. If the telephone module 50 is in the call waiting state, then a switch calls operation is initiated, as indicated at 176, then the method loops back to 152 to again monitor the on-call state. If the telephone module 50 is not in the call waiting state, then it is determined if the telephone module 50 is in conference call state, as indicated at 178. If the telephone module is not in conference call state, the method loops back to 152 to again monitor the on-call state. If the telephone module 50 is in conference call state, then a bridge calls operation is initiated, as indicated at 180, then the method loops back to 152 to again monitor the on-call state.

If the telephone module 50 is not in the on-call state, it is then determined at 154 whether a switch 12 has been activated. If the switch 12 has been activated, the "voice recognition" (initiate-a-call) operation is activated, as indicated at 156. Then the method loops back to 152 to again monitor the on-call state. If the switch 12 has not been activated, then it is determined if the telephone is in the ringing state, as indicated at 158.

If the telephone module 50 is not in the ringing state, a test state is entered to determine if a wireless signal is being transmitted, as indicated at 168. Once the wireless signal has been detected, link-mode is established and the method loops back to 152 to again monitor the on-call state.

If the telephone module 50 is in the ringing state, then it is determined if the switch 12 has been activated, as indicated at 160. If the switch 12 has been activated, then the call is answered, as indicated at 162. If the switch 12 has not been activated then the method loops back to 158 to determine if the telephone module 50 is still in the ringing state.

Once the call has been answered, as indicated at 162, the telephone module 50 is in the on-call state and it is then determined whether a switch 12 has been activated, as indicated at 164, and the method continues as described above.

While there has been described what are believed to be exemplary preferred embodiments of the present invention, those skilled in the art will recognize that other and further changes and modifications may be made thereto without departing from the scope of the invention which is defined by the appended claims.

Claims:

1. A wireless communication system, comprising:

a wireless headset unit including a headset switch having a selectable activation state, and a headset circuit, the headset circuit transmitting a wireless signal upon detection of the selectable activation state of the headset switch; and

a telephone module including a telephone module circuit, the telephone module circuit providing telecommunication between the wireless headset and the telephone module upon receiving the wireless signal.

2. The wireless communication system as recited in claim 1, wherein the wireless headset unit operates in one of a sleep mode and an active mode, the headset entering the active mode upon detection of the activation state of the headset switch.

3. The wireless communication system as recited in claim 1, wherein the telephone module operates in one of a sleep mode, a test mode and an active mode, the telephone module normally operating in the sleep mode and periodically entering the test mode to detect the presence of the wireless signal and upon the wireless signal being detected entering into the active mode.

4. The wireless communication system as recited in claim 1, wherein the headset circuit comprises a headset control circuit and a headset transceiver, the headset control circuit causing the headset transceiver to transmit the wireless signal upon detection of the selectable activation state of the headset switch.

5. The wireless communication system as recited in claim 1, wherein the telephone module circuit comprises a telephone module control circuit, a telephone module transceiver and a microphone circuit, the telephone module

control circuit causing a shorting connection across the microphone circuit upon detection of the wireless signal by the telephone module transceiver, the shorting connection occurring for a predetermined duration of time.

6. The wireless communication system as recited in claim 5, wherein the telephone module circuit further includes a telephone module switch to provide the shorting connection.

7. The wireless communication system as recited in claim 6, wherein the telephone module switch is an FET switch.

8. The wireless communication system as recited in claim 5, wherein the predetermined duration of time is between 100 mS and 500mS.

9. The wireless communication system as recited in claim 5, wherein the shorting connection initiates an operation of the telephone module.

10. The wireless communication system as recited in claim 9, wherein the operation comprises selectively from a group comprising off-hook, on-hook, and initiate-a-call.

11. The wireless communication system as recited in claim 10, wherein the group further comprises switch call-waiting and bridge conference call.

12. The wireless communication system as recited in claim 9, wherein the shorting connection duration of time is substantially concurrent with the selectable activation state of the headset switch.

13. The wireless communication system as recited in claim 9, wherein the shorting connection duration of time is substantially concurrent with a detection of a modulated signal on the wireless signal.

14. The wireless communication system as recited in claim 9, wherein a multiple activation of the activation state of the headset switch to provide multiple sequences of the wireless signal causing multiple shorting connections, the multiple shorting connections initiating a second operation.

15. The wireless communication system as recited in claim 14, wherein the second operation comprises selectively one of switch call-waiting and bridge conference call.

16. The wireless communication system as recited in claim 1, wherein the wireless signal is an RF carrier.

17. The wireless communication system as recited in claim 1, wherein the wireless signal is a digital signal.

18. The wireless communication system as recited in claim 1, wherein the wireless signal is an RF signal modulated with a generated tone.

19. The wireless communication system as recited in claim 1, wherein the wireless headset is an earpiece.

20. The wireless communication system as recited in claim 1, wherein the telephone module is a belt-mount unit having a cellular telephone interface.

21. The wireless communication system as recited in claim 1, wherein the telephone module is an adapter style module configured for attachment to a cellular phone.

22. The wireless communication system as recited in claim 1, wherein the telephone module is a cellular telephone.

23. The wireless communication system as recited in claim 1, wherein the headset switch is a momentary contact switch.

24. A wireless communication system, comprising:

a wireless headset unit including a first headset switch to actuate the wireless headset unit, a second headset switch having a selectable activation state to provide a shorting signal, and a headset circuit, the headset circuit transmitting a wireless signal upon detection of the actuation of the wireless headset unit; and

a telephone module including a telephone module circuit having a microphone circuit, wherein a shorting across the microphone circuit occurs upon detection of the shorting signal provided by the activation state of the second headset switch, the telephone module circuit providing telecommunication between the wireless headset and the telephone module upon receiving the wireless signal.

25. The wireless communication system as recited in claim 24, wherein the wireless signal is modulated with the shorting signal.

26. The wireless communication system as recited in claim 24, wherein the telephone module operates in selectively one of a sleep mode, a test mode and an active mode, the telephone module normally operating in the sleep mode and

periodically entering the test mode to detect the presence of the wireless signal and upon the wireless signal being detected entering into the active mode.

27. The wireless communication system as recited in claim 24, wherein the headset circuit comprises a headset control circuit and a headset transceiver, the headset control circuit causing the headset transceiver to transmit the wireless signal upon actuation of the wireless headset unit.

28. The wireless communication system as recited in claim 24, wherein the telephone module circuit further includes a telephone module switch to provide the shorting connection.

29. The wireless communication system as recited in claim 28, wherein the telephone module switch is an FET switch.

30. The wireless communication system as recited in claim 24, wherein the shorting connection occurs for a predetermined duration of time.

31. The wireless communication system as recited in claim 30, wherein the predetermined duration of time is between 100 mS and 500mS.

32. The wireless communication system as recited in claim 24, wherein the shorting connection initiates an operation of the telephone module.

33. The wireless communication system as recited in claim 32, wherein the operation comprises selectively from a group comprising off-hook, on-hook, and initiate-a-call.

34. The wireless communication system as recited in claim 33, wherein the group further comprises switch call-waiting and bridge conference call.

35. The wireless communication system as recited in claim 24, wherein the shorting connection duration of time is substantially concurrent with a detection of the shorting signal.

36. The wireless communication system as recited in claim 24, wherein a multiple activation of the activation state of the second headset switch to provide multiple sequences of the shorting signal causing multiple shorting connections, the multiple shorting connections initiating a second operation.

37. The wireless communication system as recited in claim 36, wherein the second operation comprises selectively one of switch call-waiting and bridge conference call.

38. The wireless communication system as recited in claim 24, wherein the wireless signal is an RF carrier.

39. The wireless communication system as recited in claim 24, wherein the shorting signal is a digital signal.

40. The wireless communication system as recited in claim 24, wherein the shorting signal is an RF signal modulated with a generated tone.

41. The wireless communication system as recited in claim 24, wherein the wireless headset is an earpiece.

42. The wireless communication system as recited in claim 24, wherein the telephone module is a belt-mount unit having a cellular telephone interfaee.

43. The wireless communication system as recited in claim 24, wherein the telephone module is an adapter style module configured for attachment to a cellular phone.

44. The wireless communication system as recited in claim 24, wherein the telephone module is a cellular telephone.

45. The wireless communication system as recited in claim 24, wherein the headset switch is a momentary contact switch.

46. A wireless communication system, comprising:

a wireless headset unit including a headset switch, a headset processing device and a headset transceiver, the headset processing device in response to detecting an activation of the headset switch being operative to activate the headset transceiver to provide for transmission of a wireless signal; and

a telephone module including a telephone module transceiver, a telephone module processing device, and a telephone module switch, the telephone module processing device activating the telephone module switch in response to the telephone module transceiver detecting the wireless signal such that wireless telecommunication between the wireless headset and the telephone module is established.

47. The wireless communication system as recited in claim 46, wherein the telephone module further includes a microphone circuit.

48. The wireless communication system as recited in claim 47, wherein activating the telephone module switch provides a shorting connection across the microphone circuit.

49. The wireless communication system as recited in claim 46, wherein the wireless headset is configured as a wireless earpiece.

50. The wireless communication system as recited in claim 46, wherein the telephone module is configured as a belt-mount unit having a cellular telephone interface.

51. The wireless communication system as recited in claim 46, wherein the telephone module is an adapter style module configured for attachment to a cellular phone.

52. The wireless communication system as recited in claim 46, wherein the telephone module is a cellular phone.

53. The wireless communication system as recited in claim 46, wherein the headset switch is a momentary contact switch.

54. The wireless communication system as recited in claim 46, wherein the telephone module switch is an FET switch.

55. The wireless communication system as recited in claim 46, wherein activating the telephone module switch provides an operation.

56. The wireless communication system as recited in claim 55, wherein

the operation comprises selectively from a group comprising off-hook, on-hook, initiate-a-call, switch call-waiting and bridge conference call.

57. The wireless communication system as recited in claim 46, wherein the wireless signal is an RF carrier.

58. The wireless communication system as recited in claim 46, wherein the wireless signal is a digital signal.

59. The wireless communication system as recited in claim 46, wherein the wireless signal is an RF signal modulated with a generated tone.

60. The wireless communication system as recited in claim 59, wherein the shorting connection lasts substantially as long as the detection of the modulated tone on the RF signal.

61. The wireless communication system as recited in claim 46, wherein a multiple activation of the activation state of the headset switch to provide multiple sequences of the wireless signal causing multiple shorting connections, the multiple shorting connections initiating a second operation.

62. The wireless communication system as recited in claim 61, wherein the second operation comprises selectively one of switch call-waiting and bridge conference call.

63. A method for using a wireless communication system in which a telephone module is used in conjunction with a wireless headset, comprising:

activating a headset switch to provide a wireless signal transmission generated from the wireless headset; and

detecting by the telephone module the wireless signal transmission to provide telecommunication between the wireless headset and the telephone module.

64. The method as recited in claim 63, wherein activating the wireless headset comprises:

activating a headset switch;

sensing the activating of the headset switch by a headset control circuit to provide a control signal;

sending the control signal to a headset transceiver; and

transmitting the wireless signal transmission by the headset transceiver upon receipt of the control signal.

65. The method as recited in claim 63, wherein detecting by the wireless signal transmission comprises:

periodically activating a telephone module transceiver to detect the presence of the wireless signal; and

once the wireless signal has been detected by the telephone module transceiver, initiating an operation.

66. The method as recited in claim 65, wherein initiating the operation comprises shorting a microphone connection.

67. The method as recited in claim 65, wherein the operation comprises selectively from one of initiating a call, answering a call, and hanging up a call.

68. The method as recited in claim 65, wherein the activating of the fist switch comprises multiple presses of the headset switch.

69. The method as recited in claim 68, wherein the operation comprises selectively from one of switching calls when there is a call waiting, and bridging calls when there is a conference call.

70. A method for using a wireless communication system in which a cellular phone is used in conjunction with a remote wireless headset, wherein the cellular phone having an on-call state, an off-call state and a ringing state, and the wireless headset having a switch, comprising:

pressing a switch on a remote wireless headset to initiate a call being generated from a cellular phone when the cellular phone is in the off-call state;

pressing a switch on a remote wireless headset to answer a call being placed to a cellular phone when the cellular phone is in the ringing state; and

pressing a switch on a remote wireless headset to hang-up a call currently in telecommunication with a cellular phone when the cellular phone is in the on-call state.

71. The method as recited in claim 70, the cellular phone further having a call-waiting state and a conference call state, wherein pressing the switch on the remote wireless headset comprises a plurality of presses, the plurality of presses to provide switching a call when the cellular phone is in the call-waiting state and bridging a call when the cellular phone is in the conference call state.

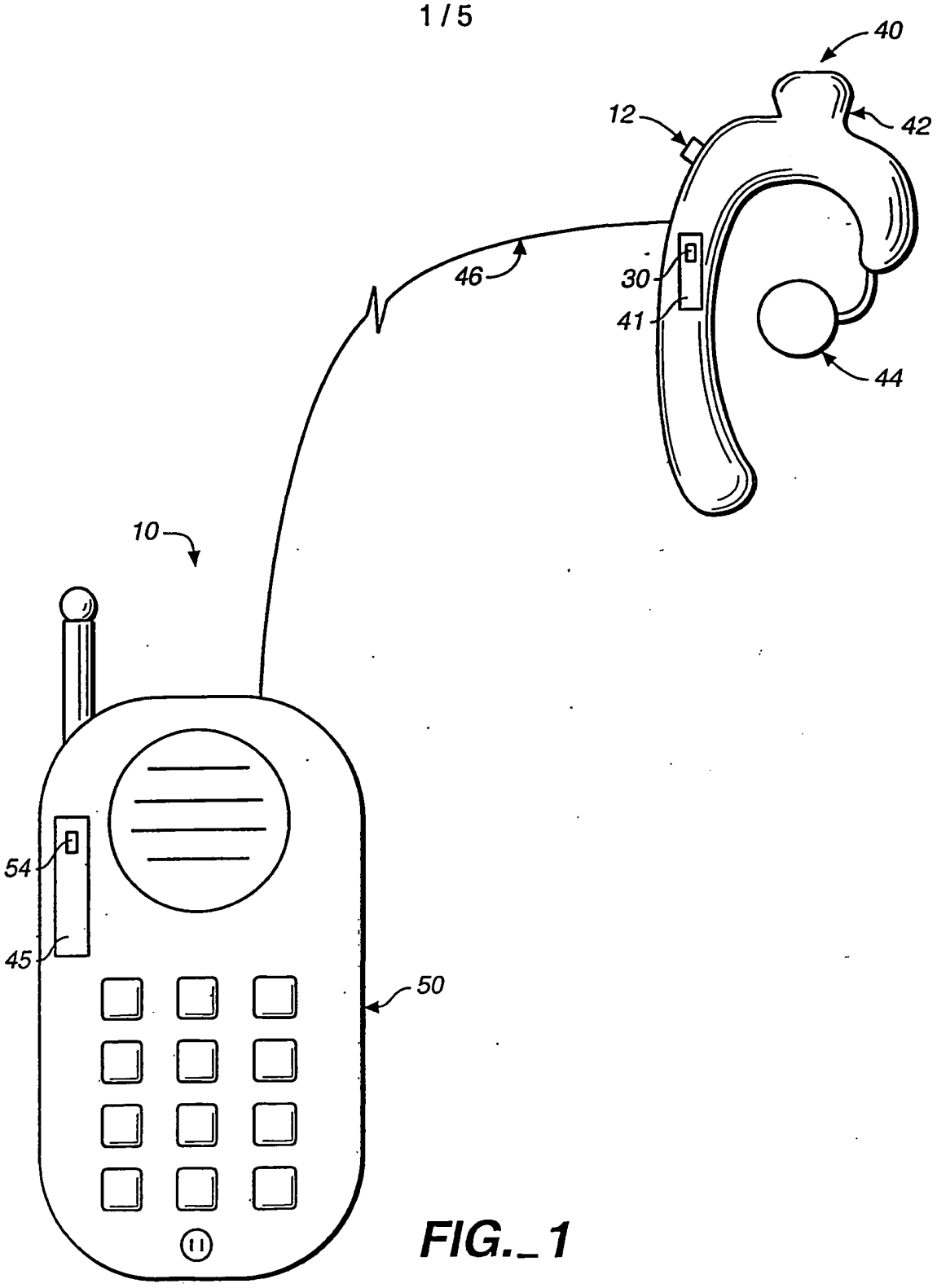

FIG._1

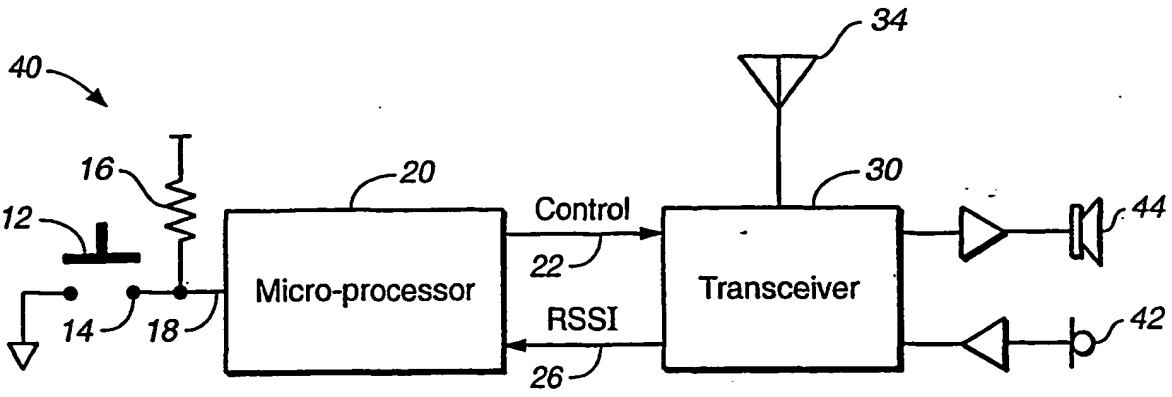
40
16
12
14
18
20
Micro-processor
Control
22
RSSI
26
34
30
Transceiver
44
42

FIG._2

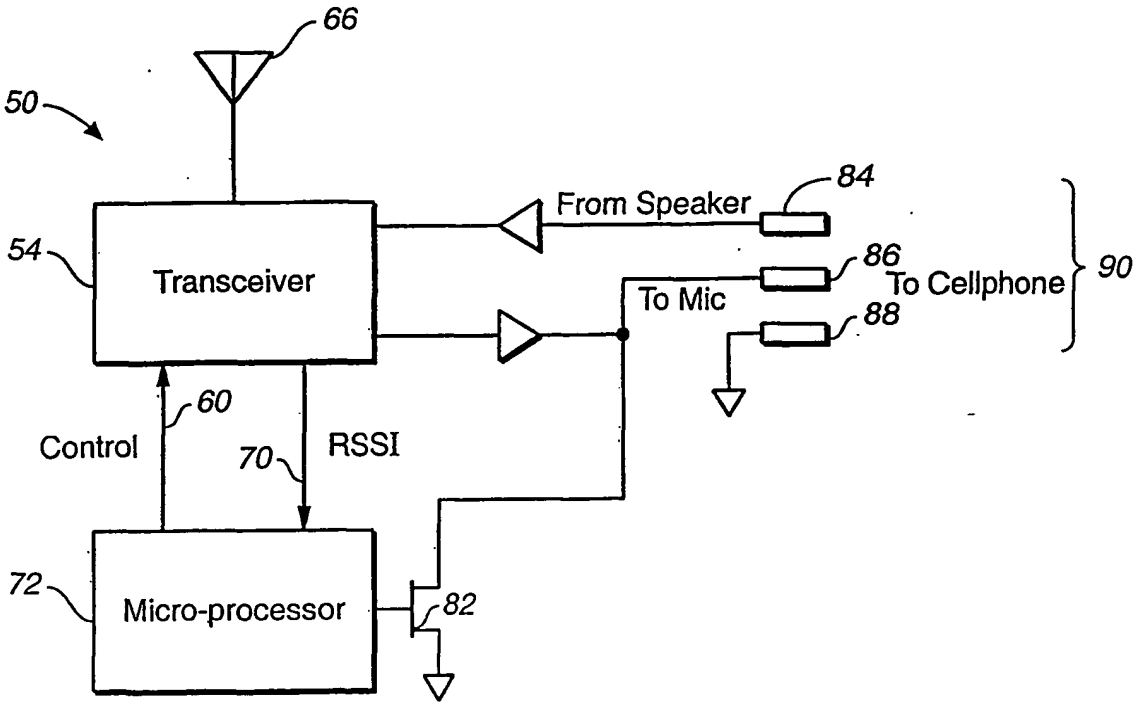
66
50
54
Transceiver
From Speaker
84
86
To Mic
To Cellphone
88
90
60
Control
70
RSSI
72
Micro-processor
82

FIG._3

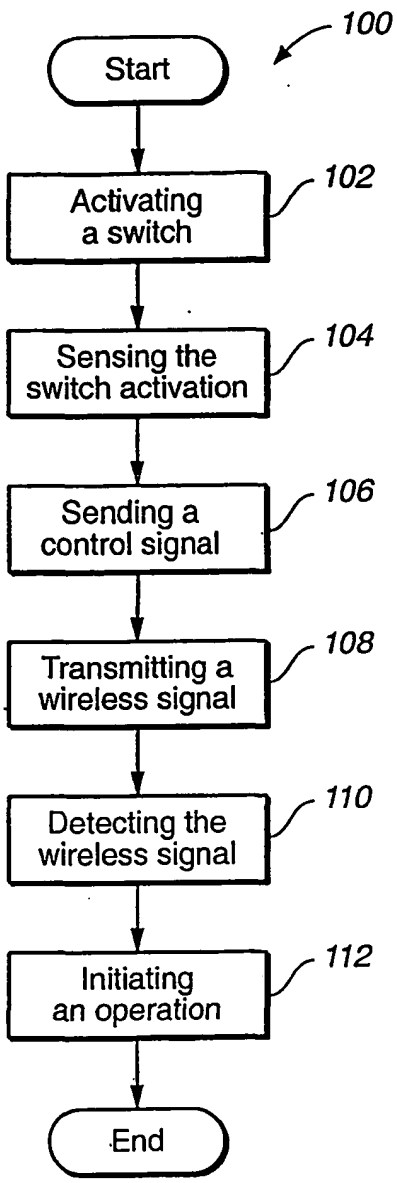
100
Start
Activating a switch
102
Sensing the switch activation
104
Sending a control signal
106
Transmitting a wireless signal
108
Detecting the wireless signal
110
Initiating an operation
112
End

FIG._4

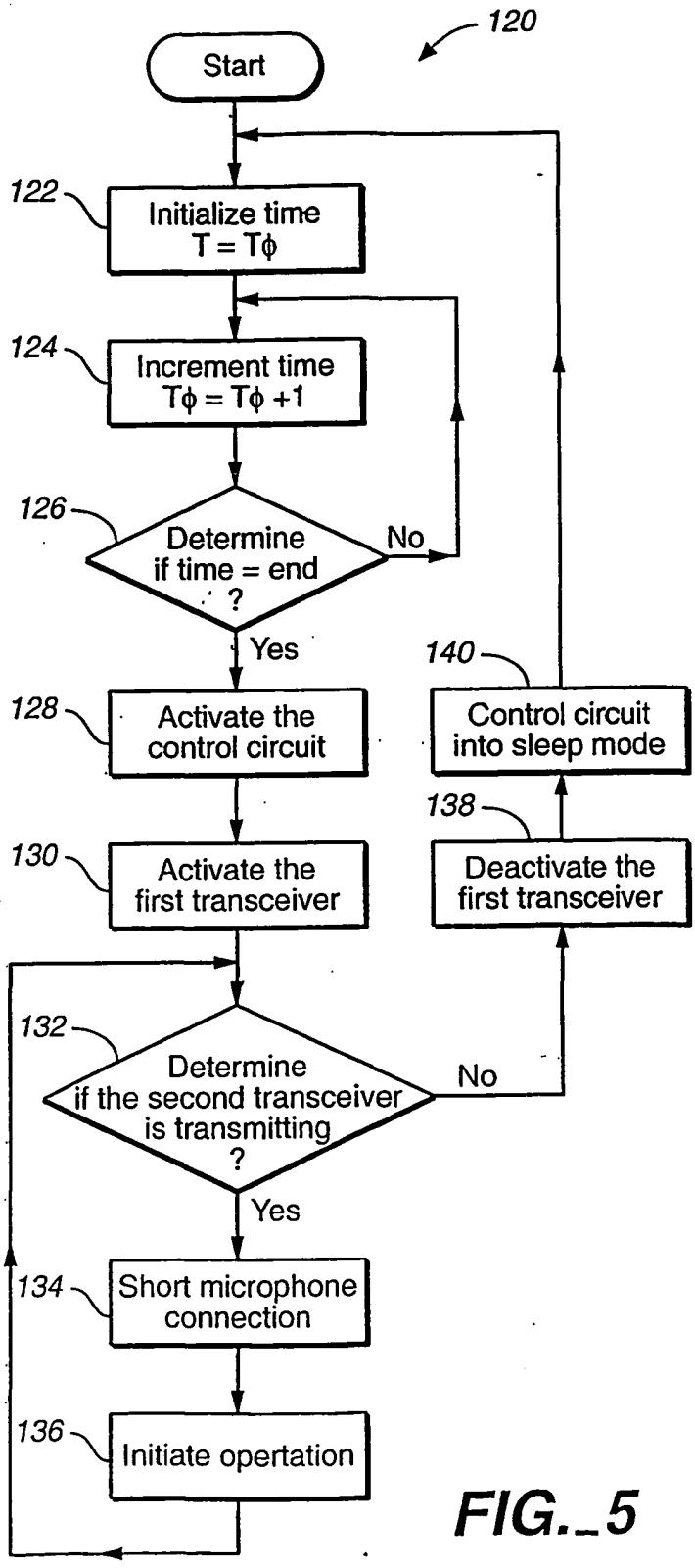
120
Start
122
Initialize time T = Tϕ
124
Increment time Tϕ = Tϕ +1
126
Determine if time = end ?
No
Yes
128
Activate the control circuit
130
Activate the first transceiver
132
Determine if the second transceiver is transmitting ?
No
Yes
134
Short microphone connection
136
Initiate opertation
140
Control circuit into sleep mode
138
Deactivate the first transceiver

FIG._5

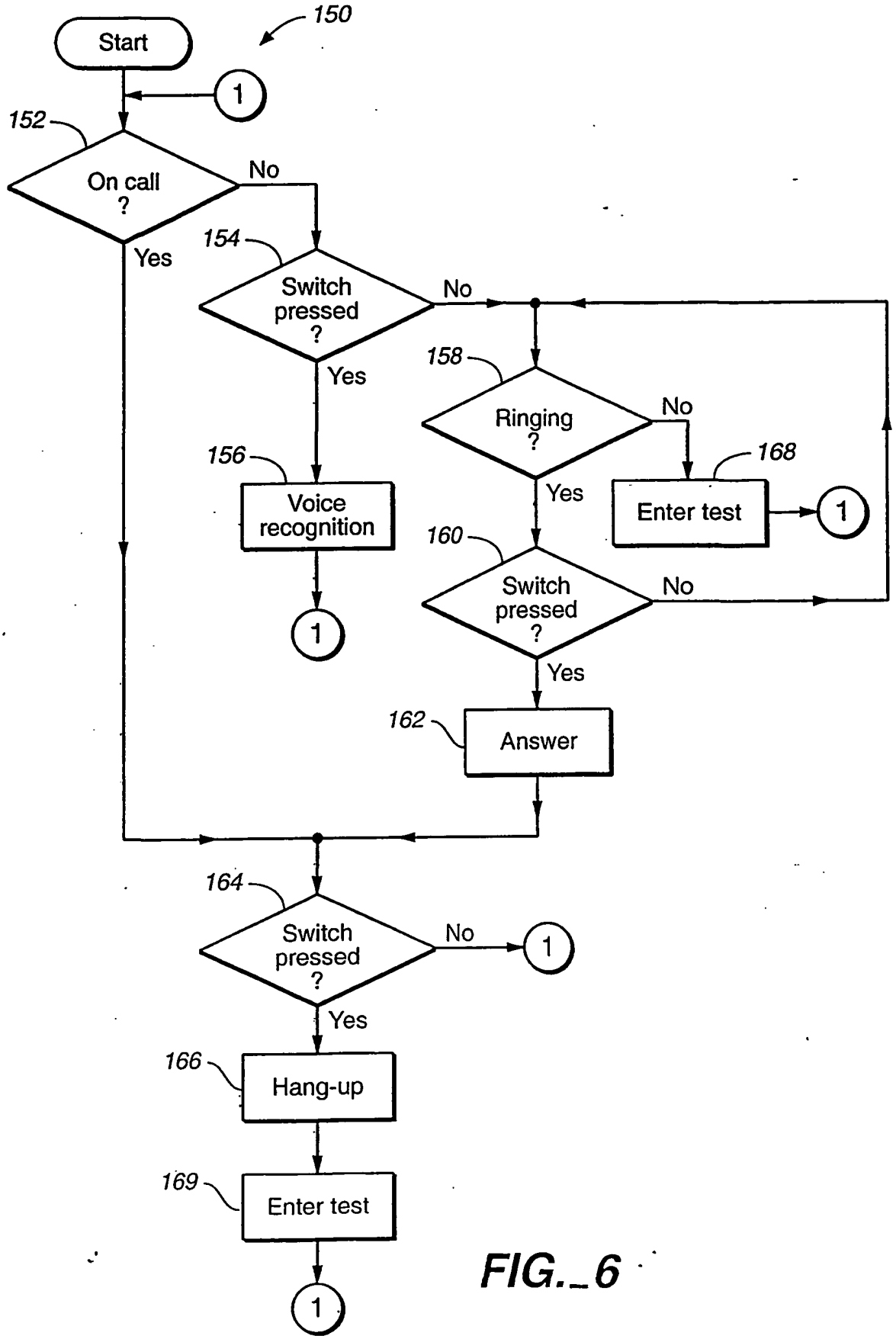
150
Start
1
152
On call ?
No
Yes
154
Switch pressed ?
No
Yes
158
Ringing ?
No
Yes
156
Voice recognition
168
Enter test
1
160
Switch pressed ?
No
Yes
1
162
Answer
164
Switch pressed ?
No
1
Yes
166
Hang-up
169
Enter test
1

FIG._6

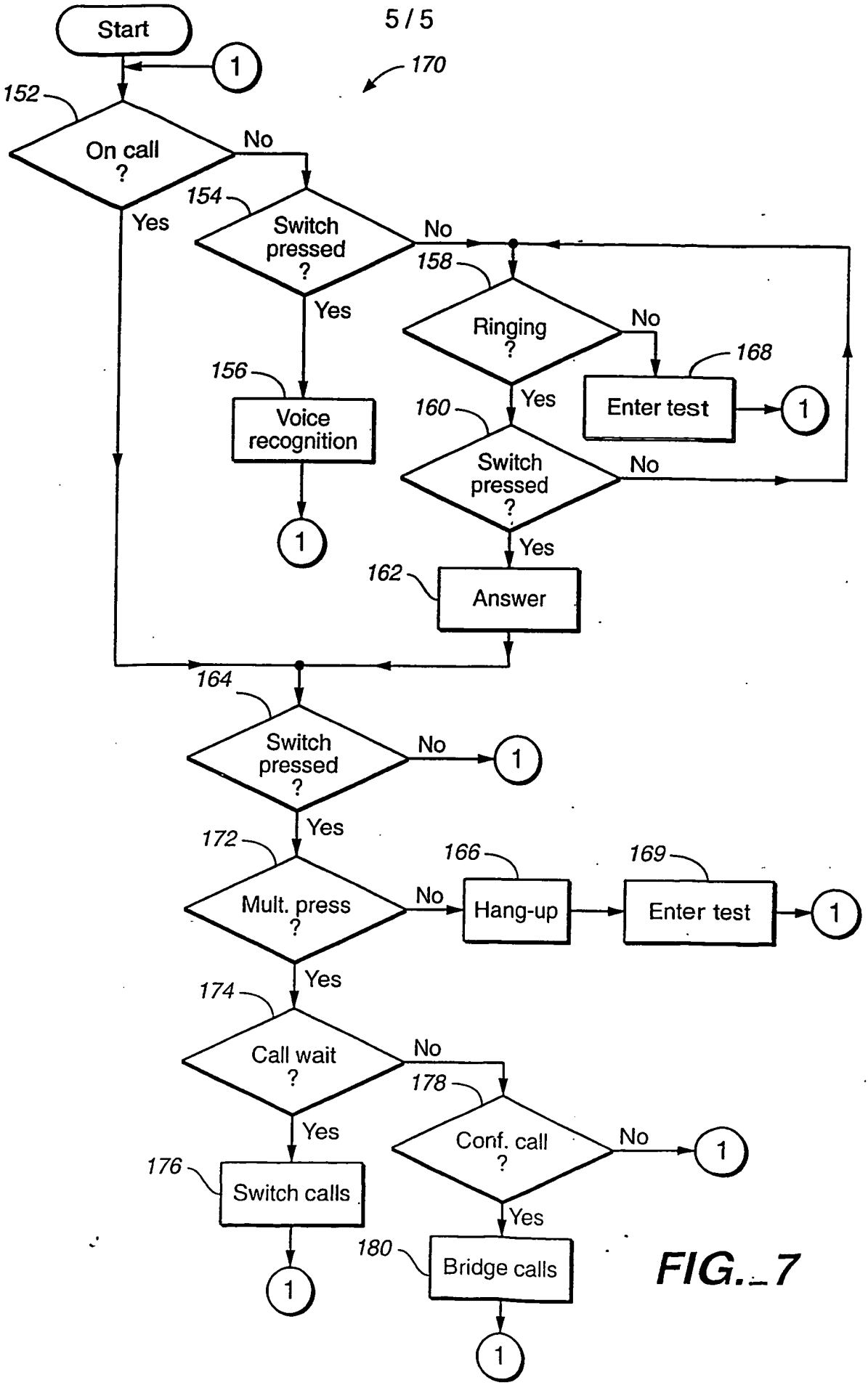
Start
1
170
152
On call ?
No
Yes
154
Switch pressed ?
No
Yes
158
Ringing ?
No
Yes
168
Enter test
1
156
Voice recognition
1
160
Switch pressed ?
No
Yes
162
Answer
164
Switch pressed ?
No
1
Yes
172
Mult. press ?
No
166
Hang-up
169
Enter test
1
Yes
174
Call wait ?
No
Yes
178
Conf. call ?
No
1
Yes
176
Switch calls
1
180
Bridge calls
1

FIG._7